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ABSTRACT

This Education Consolidation and Improvement Act (ECIA), Chapter II project combined acquisition of instructional equipment with teacher training to improve the geographic skills of students in grades six through eight in the Dade County Public Schools, Florida. Map and globe materials from three different publishers (the George F. Cram Company, the Nystrom Company, and Rand McNally) were purchased and applied for this purpose. One teacher from each of the district's 47 middle and junior high schools was trained in the use of specific materials through the district's teacher education center, assisted by publishers' representatives. One class in each participating school was taught a four-week unit in geographic skills. Evaluation was by the National Council for Geographic Education Competency-Based Geography Test, Intermediate Level. Acceptable data were obtained from 35 schools. Pretest to posttest gains were significant at all schools. Analysis of the effect of publishers' materials indicated that the materials published by the George F. Cram Company were more effective in grades six and seven than the other publishers' materials. (Author/MDE)

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DADE COUNTY PUBLIC SCHOOLS

EVALUATION OF THE 1985-86

ECIA, CHAPTER II

TEACHING GEOGRAPHIC SKILLS PROJECT

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EVALUATION OF THE 1985-86
ECIA, CHAPTER II
TEACHING GEOGRAPHIC SKILLS PROJECT

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EVALUATION OF THE 1985-86
ECIA, CHAPTER II
TEACHING GEOGRAPHIC SKILLS PROJECT

Executive Summary

The project for teaching geographic skills combined the acquisition of instructional equipment with teacher training to improve the geographic skills of students in grades six through eight. Map and globe materials from three different publishers were purchased and applied to this purpose. Representatives from each of the three publishers participated in inservice training for project teachers.

After the equipment was received and the teachers trained, a 4-week skills unit was taught to a class of students in one of the grades 6 through 8, in each school, and the results appraised through pre- and posttesting.

The evaluation found the project to have performed all activities as specified in the proposal. Additionally, statistically significant pretest to posttest gains were made by students in virtually all of the project schools. Analysis of the test scores resulted in the following recommendation.

1. Concerning the acquisition of materials for teaching map and globe skills at the 6th and 7th grade levels, the analysis indicates that materials produced by the George F. Cram Company should be given preference over those from the Nystrom Company or Rand McNally, where it is feasible to do so.

Description of the Project

The 1985-86 project for teaching geographic skills was funded in the amount of $100,000 under the Education Consolidation and Improvement Act (ECIA), Chapter II. The project is described as combining teacher training with the acquisition of instructional equipment to improve the geographic skills of students in grades six through eight.

The project proposed to train one teacher from each junior high/middle school in the teaching of map and globe skills, and to purchase map and globe equipment for each of the schools.

After the equipment was received and the teachers trained, a 4-week skills unit was taught to a class of students in one of the grades 6 through 8, in each school, and the results appraised through pre- and posttesting with a published test selected and purchased for the purpose.

The Evaluation

Purchase and Distribution of Equipment

Purchase orders for the acquisition of map and globe materials, and for the testing materials, for the middle and junior high schools were examined. Although it was not mentioned in the proposal, teaching materials of comparable scope and quality were purchased from the three companies which offered material of this kind: The George F. Cram Company, the Nystrom Company, and Rand McNally. Sixteen units were purchased from each publisher. Although the packages were not randomly assigned to the schools, the alphabetical order of distribution that was used did tend to distribute each type of materials more or less equally across all the administrative areas.

Training of Teachers

The program director provided rosters of teachers who received TEC-conducted inservice training in map and globe skills in one of three sessions from mid-December, 1985 through mid-January, 1986 (one session for each of the three material package types). A representative from each of the publishers participated in the training. One teacher from each participating school received inservice in the use of the materials package that that school was to receive. According to the summary evaluation reports received by the program director from the TEC, the teachers in each group rated the inservice well above average.

The 4-Week Skills Unit

Testing. One class in each participating school was taught a four week unit by the newly trained teacher, using the newly acquired

materials. Tests were administered to determine the extent to which students receiving instruction in the skills unit showed improvement in geographic skills. Pre and posttesting of all student participants was conducted by participating teachers at each of the participating schools, using a test developed by the National Council of Geographic Education, the Intermediate Level Geography Test. The project director reports that the representatives of all the companies saw the testing instrument, and each approved.

Of 75 questions on the test, only 42, selected by project personnel to reflect the subject matter taught, were administered. This reduction in the question set is described by the project director in a memorandum to the participating teachers, included here as Appendix A.

The testing materials were distributed by school mail on January 27, 1986, and the results of the pre- and posttesting returned in mid-March.

Preliminary test results by school. There are 47 middle and junior high schools in the district, and according to project personnel all returned pre- and posttest results for the classes which participated in the geography skills classes. The teachers who taught and tested the students were responsible for this reporting.

Although all schools returned data in some form, not all the information was usable. Only cases with both a pretest and a posttest score were recorded. Also, only 38 schools reported data in an acceptable form, and only 35 could be used in the evaluation analysis. The exceptions are noted below.

Table 1 gives the pre- and posttest score summaries for the 38 schools for which data were processed. Since there was no control group for the project taken as a whole, only a t statistic and associated p level is reported for each school. The results for most were highly significant statistically, and only four schools failed to achieve significance at the .05 level. Given that these skills are unlikely to be learned outside the classroom, and considering that the period of instruction was only 4 consecutive weeks, it is reasonable to regard the gains shown in table 1 as an accurate reflection of classroom activities.

Schools omitted, and distribution of surviving schools. As noted above, test data from only 35 (or 75 percent) of the 47 participating schools were usable in the analysis. For three schools, data were reported for the school-by-school analysis in table 1, but not used in the covariance analysis. Two schools, 6251 and 6331, reported a mixed class of 7th and 8th grades, with no way of distinguishing the scores. Since it was desirable to separate 7th and 8th graders, these schools were left out. Another school, 6881, tested gifted 7th grade students, resulting in a ceiling effect in the data.

Table 1

Test Results By School for
the 4-Week Skill Unit Classes

No.	Location	N	Pretest Avg	Pretest StD	Posttest Avg	Posttest StD	t	p	
1	6011	21	17.14	5.30	20.14	4.65	3.18	0.00485	
2	6021	23	27.52	4.92	26.26	8.12	-1.17	0.25471	*
3	6030	22	15.27	7.37	23.68	8.57	6.68	0.00002	
4	6061	31	26.90	7.85	33.58	9.00	5.56	0.00004	
5	6071	28	22.61	7.72	25.07	7.30	3.76	0.00113	
6	6081	23	29.39	5.79	34.04	4.19	5.06	0.00014	
7	6091	23	18.30	5.83	20.57	7.34	1.93	0.06346	*
8	6141	25	15.48	4.24	26.04	6.53	12.85	0.00000	
9	6171	30	25.80	5.50	36.57	2.47	15.25	0.00000	
10	6211	26	31.69	5.28	34.81	4.76	3.05	0.00544	
11	6221	33	34.55	4.05	36.36	3.64	2.66	0.01178	
12	6241	20	14.60	6.08	26.50	9.97	6.37	0.00003	
13	6251	16	27.75	9.26	35.69	4.77	4.78	0.00043	
14	6301	24	29.71	8.71	52.42	9.62	10.91	0.00000	
15	6331	23	22.04	6.42	25.91	8.19	3.02	0.00630	
16	6351	19	16.95	6.92	23.58	8.77	4.22	0.00076	
17	6371	24	24.83	4.04	34.54	2.24	12.60	0.00000	
18	6391	26	20.46	7.38	25.85	5.84	4.60	0.00026	
19	6411	23	9.57	5.35	19.57	9.38	6.38	0.00002	
20	6431	13	17.77	6.23	29.31	8.17	5.52	0.00028	
21	6441	28	27.68	6.23	30.75	5.58	4.80	0.00016	
22	6481	18	21.72	5.59	29.72	4.44	7.51	0.00001	
23	6541	27	23.19	5.58	30.26	6.40	6.66	0.00001	
24	6571	33	29.15	4.74	30.30	3.95	1.83	0.07282	*
25	6631	18	24.44	6.80	33.72	5.11	5.91	0.00007	
26	6681	24	22.88	6.42	26.04	7.06	10.06	0.00000	
27	6721	27	19.15	7.09	22.07	6.42	3.44	0.00230	
28	6741	24	20.04	9.94	26.25	7.03	4.01	0.00080	
29	6761	25	20.96	6.23	25.16	6.35	3.57	0.00177	
30	6781	22	23.18	6.55	26.09	5.85	2.58	0.01659	
31	6801	35	26.34	7.43	32.49	4.99	7.55	0.00000	
32	6821	16	31.06	6.25	33.19	5.27	4.82	0.00041	
33	6841	32	29.72	5.78	30.53	5.95	1.22	0.22803	*
34	6861	30	23.83	7.38	31.00	5.89	8.64	0.00000	
35	6881	9	33.56	3.24	40.56	0.50	6.35	0.00043	
36	6911	22	23.55	6.24	33.05	6.50	24.7	0.00000	
37	6961	25	24.12	7.76	33.08	3.16	6.21	0.00002	
38	6981	22	19.95	7.18	22.91	6.23	2.40	0.02459	

* Asterisks indicate schools where mean differences are not significant at the .05 level.

Another nine schools in question were omitted due to unacceptable data format or other irregularities, or because the inventory forms could not be located.

There is good indication that this loss of schools from the analysis did not introduce any serious bias into the distribution. Table 2 shows the distribution of schools and students tested over the selected variables of interest. The schools are as evenly divided as possible over the areas of administration, reducing the problem of over- or underrepresenting the inner city or suburban schools. The schools are also evenly divided in the number that use each of the three different materials packages.

Table 2

Distribution of the 35 Schools
in the Analysis By Relevant Groupings

Grouping	Number of Schools	Number of Students
Area		
North	8	192
North Central	9	211
South Central	9	233
South	9	226
Grades		
6	4	110
7	9	219
8	20	482
9	2	51
Grades Grouped		
Lower (6&7)	13	329
Upper (8&9)	22	533
Materials Source		
Cram Co. (C)	12	329
Nystrom Co. (N)	11	269
Rand McNally (R)	12	264
Materials by Grade Level		
Lower (grades 6 & 7)		
C/6&7	4	114
N/6&7	5	123
R/6&7	4	92
Upper (grades 8 & 9)		
C/8&9	8	215
N/8&9	9	146
R/8&9	8	172
Overall Totals	35	862

The schools were not equally divided on the grades tested, however, a fact also true of the total set of schools. More eighth grade classes were taught and tested than the other grades combined. There were not enough 6th or 9th grade classes to cover all the types of materials packages. To address these problems, the schools testing 6th and 7th grade classes were combined to create a lower grade group, and the schools testing 8th and 9th grades were combined into an upper level group. The materials groupings were then found to be equally distributed by school across each grade level grouping, when level was controlled. This was considered acceptable for an analysis of grade-by-materials effects.

Analysis of the Test Scores

Variance accounted for. The summary statistics for the factorial analysis of covariance are given in Appendix B. A regression approach with effect coding was used, and the variables included, including the interaction terms, accounted for about 49 percent of the variance. As with most studies of this type, the covariate (the pretest) is responsible for most of the variance accounted for, some 44 percent. The "treatment" effects of interest (i.e. the different publishers' packages) account for around 3 percent, but the effect is highly significant, statistically. There is no significant interaction with grade level.

The adjusted means. Table 3 gives the adjusted means from the analysis of covariance. For the lower level (grades 6 and 7),

Table 3

Adjusted Posttest Means
By Grade Level and Materials Publisher

Grade	C	N	R
Lower (6&7)	31.21	26.30	26.56
Higher (8&9)	31.75	30.08	29.17

the mean for the group of schools using the "C" materials package is clearly larger than the means for the other two groups at that level. In fact, using this package, the lower level students perform as well as those in the upper level. The difference between the C "treatment" and the other two at the lower level is statistically significant beyond the .01 level. At the upper grade level, however, the means do not differ across the different materials types at the .05 level, indicating that it does not matter among 8th and 9th graders which set of materials is used.

Discussion and Recommendations

The geographic skills project was found to have performed all the activities specified in the project proposal: equipment was purchased and distributed to the specified schools; consultants were engaged and teachers trained in the use of the equipment; each teacher taught, tested, and reported test results for a 4-week unit on geographic skills.

Since the project is completed, and no further activities planned, no recommendations regarding the project are warranted. However, the analysis of the test results suggests the following recommendation concerning the purchase and use of map-and-globe materials in 6th and 7th grade classrooms.

1. Concerning the acquisition of materials for teaching map and globe skills at the 6th and 7th grade levels, the analysis indicates that materials produced by the George F. Cram Company should be given preference over those from the Nystrom Company or Rand McNally, where it is feasible to do so.

Appendix A

M E M O R A N D U M

January 27, 1986

TO: Map and Globe Skills Teacher Participants

FROM: Paul S. Hanson, Supervisor PSH
Social Studies

SUBJECT: EVALUATION OF THE MAP AND GLOBE SKILLS PROGRAM

Enclosed you will find materials to be used to evaluate the Map and Globe Skills Program implementation in your school. The materials include a packet for the National Council for Geographic Education Competency-Based Geography Test, Intermediate Level. The packet includes an administrator's manual, 35 student test booklets, a matrix for grading, a black-line master answer sheet, and a student inventory sheet.

As was stated in the workshop, you are to administer the pretest to one class of students prior to beginning the map and globe skills unit. Please grade each student's test and record the raw score of correct responses after the name of each student on the student inventory sheet. At the conclusion of the unit administer the posttest results in the same manner. As in the case of the maps and globes, you may retain the test materials for future use. The only item to be returned to me (mail code 9999 - Room 920) is the student inventory sheet. This should be returned no later than March 14, 1986.

The items to be answered by students are as follows:

1 through 14, 16, 28 through 31, 34, 35, 36, 38, 40 through 44, 54, 55, 61, 62, 64, 65, & 68 through 75. (A total of 42 items).

The pretest and posttest are one in the same. The test is not a timed test. Use your own judgment.

Thank you for your cooperation in this project. I hope the training you received and the materials sent to you will be beneficial to your school's instructional program. If you have any questions, please do not hesitate to contact me at 376-1985.

PSH/mb

cc: Principal
Project Managers
Tom Dunthorn

Enclosures

Appendix B

SUMMARY OF THE ANALYSIS OF COVARIANCE FOR THE GEOGRAPHIC SKILLS PROJECT

Covariate = pretest
Grade Level = lower (6th and 7th), upper (8th and 9th).
Materials = three types of map and globe packages, where C represents the Geo. Cram Co. product, N stands for the Nystrom Co.'s product, and R is for the Rand-McNally package.

VARIANCE SOURCE	PROP. OF VARIANCE	SUM OF SQUARES	df	MEAN SQUARES	Hierarchical Step-down F-ratio	p <=
Pretest	0.440133	29698.898	1	29698.898	736.276	0.00000
Grade Level	0.015794	1065.737	1	1065.737	26.421	0.00000
Materials	0.028329	1911.546	2	955.773	23.695	0.00000
Interaction	0.006432	434.028	5	86.806	2.152	0.05666
Error	0.509312	34366.836	852	40.337		
Total	1.000000	67477.045	861			

MEANS:

	Lower Grades			Higher Grades		
	C	N	R	C	N	R
Original	32.18	23.41	26.41	33.53	28.72	29.62
Adjusted	31.21	26.30	26.56	31.75	30.08	29.17

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